REPORT No. : SZ15120141S01

# RF EXPOSURE EVALUATION REPORT

| | | |
|---|---|---|
| **APPLICANT** | : | SHENZHEN ANTOP TECHNOLOGY CO.,LTD. |
| **PRODUCT NAME** | : | Router Antenna |
| **MODEL NAME** | : | MV-9818 |
| **TRADE NAME** | : | N/A |
| **BRAND NAME** | : | N/A |
| **FCC ID** | : | 2AG6P09818 |
| **STANDARD(S)** | : | 47CFR 2.1091<br>KDB 447498 D01 General RF Exposure Guidance v06 |
| **ISSUE DATE** | : | 2016-01-18 |

**SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.**

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**MORLAB GROUP** FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China Tel: 86-755-36698555 Http://www.morlab.com Fax: 86-755-36698525 E-mail: service@morlab.cn

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| Change History | | |
|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | 2016-01-18 | First edition |
| | | |

# TEST REPORT DECLARATION

| | |
|---|---|
| Applicant | SHENZHEN ANTOP TECHNOLOGY CO.,LTD. |
| Applicant Address | 301, No.1 Workshop, Longqiaohua Industrial Zone, Luotian Forest Farm, Songgang Street, Baoan District, 518100 Shenzhen City, Guangdong Province, People's Republic Of China |
| Manufacturer | SHENZHEN ANTOP TECHNOLOGY CO.,LTD. |
| Manufacturer Address | 301, No.1 Workshop, Longqiaohua Industrial Zone, Luotian Forest Farm, Songgang Street, Baoan District, 518100 Shenzhen City, Guangdong Province, People's Republic Of China |
| Product Name | Router Antenna |
| Model Name | MV-9818 |
| Brand Name | N/A |
| HW Version | V1.0 |
| SW Version | V1.0 |
| Test Standards | 47CFR 2.1091;<br>KDB 447498 D01 General RF Exposure Guidance v06 |
| Issue Date | 2016-01-18 |
| SAR Evaluation | Not Required |

Tested by : Liu Jun

Liu Jun

Reviewed by : Zhu Zhan

Zhu Zhan

Approved by : Zeng Dexin

Zeng Dexin

# 1. TECHNICAL INFORMATION

Note: the following data is based on the information by the applicant.

## 1.1. Identification of Applicant

| | |
|---|---|
| Company Name: | SHENZHEN ANTOP TECHNOLOGY CO.,LTD. |
| Address: | 301, No.1 Workshop, Longqiaohua Industrial Zone, Luotian Forest Farm, Songgang Street, Baoan District, 518100 Shenzhen City, Guangdong Province, People's Republic Of China |

## 1.2. Identification of Manufacturer

| | |
|---|---|
| Company Name: | SHENZHEN ANTOP TECHNOLOGY CO.,LTD. |
| Address: | 301, No.1 Workshop, Longqiaohua Industrial Zone, Luotian Forest Farm, Songgang Street, Baoan District, 518100 Shenzhen City, Guangdong Province, People's Republic Of China |

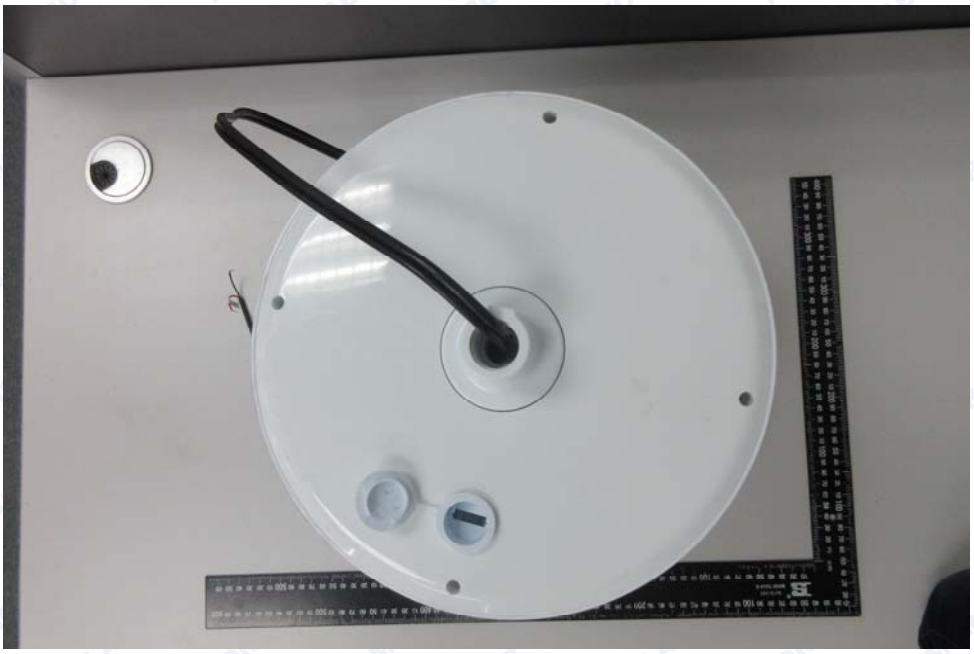
## 1.3. Equipment Under Test (EUT)

| | |
|---|---|
| Model Name: | MV-9818 |
| Trade Name: | N/A |
| Brand Name: | N/A |
| Hardware Version: | V1.0 |
| Software Version: | V1.0 |
| Frequency Bands: | Wifi802.11b/g/n20/n40:2412-2462MHz; |
| Modulation Mode: | Wifi802.11b: DSSS; Wifi802.11g/n20/n40: OFDM; |
| Antenna type: | Dedicated Antenna |
| Development Stage: | Identical prototype |

### 1.3.1. Photographs of the EUT

1. EUT side view

2. EUT top view



### 1.3.2. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

| EUT Identity | Hardware Version | Software Version |
|---|---|---|
| 1# | V1.0 | V1.0 |

## 1.4. Applied Reference Documents

Leading reference documents for testing:

| No. | Identity | Document Title |
|---|---|---|
| 1 | **47 CFR§2.1091** | Radiofrequency Radiation Exposure Evaluation: mobile devices |
| 2 | **KDB 447498 D01v06** | General RF Exposure Guidance |

## 2. DEVICE CATEGORY AND RF EXPOSURE LIMIT

Per user manual, this device is a Wifi router. Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

**Mobile Devices:**

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

**GENERAL POPULATION / UNCONTROLLED EXPOSURE**

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm$^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| **(B) Limits for General Population/Uncontrolled Exposure** | | | | |
| 0.3-1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34-30 | 824/f | 2.19/f | *(180/f$^2$) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | - | - | f/1500 | 30 |
| 1500-100,000 | - | - | 1.0 | 30 |

f = frequency in MHz * = Plane-wave equivalent power density

# 3. MEASUREMENT OF CONDUCTED PEAK OUTPUT POWER

1. Wifi 2.4G Conducted Average Output Power

ANT 1

| Band | Channel | Frequency (MHz) | Output Power(dBm) | |
|---|---|---|---|---|
| | | | 802.11b (DSSS) | 802.11g (OFDM) |
| WiFi 2.4G | 1 | 2412 | 17.45 | 12.89 |
| | 6 | 2437 | 15.61 | 12.15 |
| | 11 | 2462 | 15.65 | 12.85 |

ANT 2

| Band | Channel | Frequency (MHz) | Output Power(dBm) | |
|---|---|---|---|---|
| | | | 802.11b (DSSS) | 802.11g (OFDM) |
| WiFi 2.4G | 1 | 2412 | 15.81 | 10.62 |
| | 6 | 2437 | 17.05 | 13.07 |
| | 11 | 2462 | 13.98 | 11.22 |

| Band | Antenna | Channel | Frequency (MHz) | Output Power(dBm) |
|---|---|---|---|---|
| | | | | 802.11n20 |
| WiFi 2.4G (MIMO) | ANT1 | 1 | 2412 | 13.68 |
| | | 6 | 2437 | 12.24 |
| | | 11 | 2462 | 12.52 |
| | ANT2 | 1 | 2412 | 12.24 |
| | | 6 | 2437 | 13.05 |
| | | 11 | 2462 | 10.71 |
| | ANT1+ANT2 | 1 | 2412 | 16.03 |
| | | 6 | 2437 | 15.67 |
| | | 11 | 2462 | 14.72 |

| Band | Antenna | Channel | Frequency (MHz) | Output Power(dBm) |
|---|---|---|---|---|
| | | | | 802.11n40 |
| WiFi 2.4G (MIMO) | ANT1 | 3 | 2422 | 11.15 |
| | | 6 | 2437 | 11.58 |
| | | 9 | 2452 | 11.62 |
| | ANT2 | 3 | 2422 | 11.91 |
| | | 6 | 2437 | 12.08 |
| | | 9 | 2452 | 11.79 |
| | ANT1+ANT2 | 3 | 2422 | 14.56 |
| | | 6 | 2437 | 14.85 |
| | | 9 | 2452 | 14.72 |

Note: Only 802.11n20 and 802.11n40 support MIMO 2X2.

# 4. RF EXPOSURE EVALUATION

**Standalone transmission MPE evaluation**

| Bands | Frequency (MHz) | Antenna Gain (dBi) | Conducted Average Power (dBm) | Time-averaging EIRP (mW) | Power density (mW/cm²) | Limit for MPE (mW/cm²) |
|---|---|---|---|---|---|---|
| **802.11b** | 2412 | 5 | 17.45 | 175.79 | 0.035 | 1.0 |

Note:

1. MPE calculation method

$$\text{Power Density} = EIRP/4\pi R^2$$

Where: EIRP = P·G

P = Peak out power

G = Antenna gain

R = Separation distance (20cm)

# ANNEX C GENERAL INFORMATION

## 1. Identification of the Responsible Testing Laboratory

| | |
|---|---|
| Company Name: | Shenzhen Morlab Communications Technology Co., Ltd. |
| Department: | Morlab Laboratory |
| Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |
| Responsible Test Lab Manager: | Mr. Su Feng |
| Telephone: | +86 755 36698555 |
| Facsimile: | +86 755 36698525 |

## 2. Identification of the Responsible Testing Location

| | |
|---|---|
| Name: | Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory |
| Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |

***** END OF REPORT *****